

A REVIEW OF THE AMERICAN MOTHS OF THE GENUS COSMOPTERYX HÜBNER.

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The little moths belonging to the genus *Cosmopteryx* are probably familiar to anyone who has collected and observed insects in nature. Who has not occasionally on a warm midsummer day met with a slender little streak of gold and silver sitting in the sunshine on a leaf in a protected corner and twirling its long white-tipped antennæ in graceful motions? If, when examined more closely, it is found to be a smooth shining little moth, brown with silvery lines on palpi and antennæ, and with a striking broad golden or orange fascia across the outer half of the wing, bordered on both sides by bright metallic scales, then you have a *Cosmopteryx*.

Most of the species may at once be recognized by this characteristic ornamentation alone, without structural examination.

The genus belongs to the family Elachistidæ, and has the following structural characters: Face and head smooth. Labial palpi very long, smooth, recurved, pointed; terminal joint longer than second joint. Maxillary palpi obsolete. Antennæ nearly as long as the forewings, simple; basal joint very long. Forewings very long, narrow; apex produced, pointed; 12 veins (or sometimes only 11, vein 5 being absent); 6, 7, and 8 from a common stalk; 7 to costa; 1 b furcate at base. Hindwing linear with very long cilia; venation limited to a costal and a subcostal vein, and a simple or forked median vein; transverse vein, and veins 5, 4, and sometimes 3 being obsolete. Legs long, posterior tibiæ rough-haired.

The larvæ are leaf miners, and the mines are easily distinguished from most others by the scrupulous cleanliness with which the larva ejects all its frass through a hole, so that the mine remains clear and white. At maturity the larva changes its color from green to a vivid purple or wine-red, leaves the mine, and spins a matted flattened cocoon of silk.

The different species are very uniform in general appearance, but are not difficult to separate by small, but quite easily seen, characters.

Thus Lord Walsingham pointed out^a the value of the different positions of the white annulations of the antennæ, and suggested that the species might be tabulated by that character alone. Aside from the fact, however, that the tip of the antennæ is about the most vulnerable point, and often lost in a dry specimen, the white annulations are not quite so constant as Lord Walsingham supposed, differing occasionally in the same specimen. Nevertheless, they furnish a valuable help in the identification, and I have, in the following, given the coloration in all the species, where I know it, as it may eventually become of more importance.

The species described by the writer^b as *Cosmopteryx villetta* was at the time known only from a unique example with wings folded; even this, however, hardly excuses the mistake of referring it to the present genus; examination of the venation disclosed that the species does not belong in this genus, but in the somewhat related genus *Chryso-clista* Stainton, which thus for the first time is recorded from this continent.

The American species may be separated by the following table:

TABLE OF SPECIES OF COSMOPTERYX.

Forewings with white markings on basal half.....	1
Forewings without white markings on basal half.....	12
1. Basal half with short longitudinal white streaks <i>only</i>	2
Basal half with longitudinal white lines.....	6
2. Basal metallic margin of fascia nearly perpendicular on edge.....	3
Basal metallic margin of fascia strongly oblique.....	5
3. Dorsal edge white at base.....	<i>putcherrinella</i>
Dorsal edge not white.....	4
4. Apical margin of fascia nearly perpendicular.....	<i>climensella</i>
Apical margin of fascia strongly oblique.....	<i>gemmiferella</i>
5. Head and thorax with three prominent longitudinal lines.....	<i>attenuatella</i>
Head and thorax with one faint central line.....	<i>ipomea</i>
6. Forewings with yellow or orange fascia.....	7
Forewings without such fascia.....	<i>unicolorella</i>
7. Expanse of forewings less than 8 mm.....	8
Expanse more than 10 mm.....	11
8. Metallic spots surrounded by yellow.....	<i>quadrilineella</i>
Metallic spots edging the yellow.....	9
9. With black discal spots between first metallic spot and fascia.....	10
Without such black spot.....	<i>chalybæella</i>
10. Apical pair of metallic spots not touching edges of wing.....	<i>delicatella</i>
Both apical metallic spots reaching the edge.....	<i>minutella</i>
11. Forewings light drap colored.....	<i>fernaldella</i>
Forewing deep brown.....	<i>monticella</i>
12. Yellow fascia divided by longitudinal black streak.....	<i>nitens</i>
Fascia not thus divided.....	<i>clandestinella</i>

^a Insect Life, 1, 1889, p. 289.

^b Proc. U. S. Nat. Mus., XXVII, 1904, p. 768.

COSMOPTERYX PULCHERRIMELLA Chambers.

Cosmopteryx pulcherrimella CHAMBERS, Dyar, Cat. N. Am. Lep., No. 6072.

There is in the National Museum a series of *Cosmopteryx*, bred by Miss M. Murtfeldt in Kirkwood, Missouri, from *Pilea pumila* and rightly determined by Lord Walsingham in 1889 as the present species. There are also two specimens determined by him from North Carolina (Morrison.) I have examined identical specimens in Professor Fernald's collection, but Chambers's original type from Kentucky is not in existence.

The species has the following antennæ coloration: Terminal 4 joints white, preceding 5 joints white, next 2 black, next 1 white, next 1 black, and the following 1 white.

Miss Murtfeldt has kindly given me the following notes on the larva:

Feeds on rickweed (*Pilea pumila*), a succulent little plant of the nettle family, with adhesive, but not urticating leaves; mining, twisting, and crumpling them.

Larva yellowish white, subcylindrical.

Head shining black, with the diversions defined by narrow white lines. Cervical shield broad, oblong, with fine white central line. The sutures are very deep, giving the larva a moniliform aspect.

These larvæ are not confined to one mine, but may be seen wandering over the leaves and stems, cutting in between the two cuticles of a leaf and covering it with transparent spots of various sizes. They change to pupa under a fold of the leaf or between the wrinkles or not infrequently on the surface of the ground, protected by a very slight dingy cocoon. There seems to be several broods in a season.

COSMOPTERYX CLEMENSELLA Stainton.

Cosmopteryx clemensella STAINTON, Dyar, Cat. N. Am. Lep., 1903, No. 6062.—
BUSCK, Proc. Wash. Ent. Soc., V, 1903, p. 197.

I have examined Stainton's type of this species in the British Museum. In the National Museum is an identical specimen, which is evidently one of Clemens's original specimens obtained by the late Professor Riley. Other specimens from Pennsylvania; Boston, Massachusetts (Beutenmüller); Falls Church, Virginia (Banks), and Washington, District of Columbia (Busck).

The coloration of the antennæ, counting from the tip, is thus: Last 5-6 joints white, next 9-10 joints black, next 8-9 white, sometimes with a black dot on the third or fourth, sometimes with both these joints black.

COSMOPTERYX GEMMIFERELLA Clemens.

Cosmopteryx gemmiferella CLEMENS, Dyar, Cat. Lep. N. A., 1903, No. 6066.—
BUSCK, Proc. Wash. Ent. Soc., V, 1903, p. 197.

Of this species the U. S. National Museum possesses a specimen, which undoubtedly originally came from Clemens and which agrees with his type in the Academy of Natural Sciences in Philadelphia.

Other specimens are from Sea Cliff, New York (Banks), and from Washington, District of Columbia (Busck).

The coloration of the antennæ, which, as in the foregoing species, is not quite constant, is as follows: 3-4 last joints white, 5-8 next joints black, 1 next white, 2 next black, 3 next white.

I believe this species feeds on morning-glory, though I have not succeeded in breeding it. There is a *Cosmopteryx* mine and larva not uncommon in this plant around Washington, and I have repeatedly taken the present species on such plants.

COSMOPTERYX ATTENUATELLA Walker.

Cosmopteryx attenuatella WALKER, Dyar, Cat. N. Am. Lep., 1903, No. 6068.

The type of the synonym *Cosmopteryx lespedezeæ* Walsingham, from Texas, is in U. S. National Museum; also a specimen from Palm Beach, Florida (Dyar) and several from Santo Domingo, West Indies (Busck). The antennal coloration is as follows: 4 last joints white, 5 next joints black, 1 next white, 1 next black.

COSMOPTERYX IPOMŒÆ Busck.

Cosmopteryx ipomœæ BUSCK, Dyar, Cat. N. Am. Lep., 1903, No. 6067.

The type of this species from Palm Beach, Florida (Dyar), is in the U. S. National Museum and has the following antennal ornamentation: 3-[4?] last joints white, 5 following black, and 1 succeeding white.

COSMOPTERYX UNICOLERELLA Walsingham.

Cosmopteryx unicolorella WALSINGHAM, Dyar, Cat. N. Am. Lep., 1903, No. 6074.

I have examined the unique type of this species in Lord Walsingham's collection at Merton Hall, England. It can not be confounded with any other described American species through its total lack of a yellow or orange fascia. The species was described from California (Walsingham) and has the antennæ colored thus: 4 apical joints white, the succeeding 5 or 6 black, the next 1 joint white, the following 2 or 3 black, and the next 3 white.

COSMOPTERYX QUADRILINEELLA Chambers.

Cosmopteryx quadrilineella CHAMBERS, Dyar, Cat. N. Am. Lep., 1903, No. 6073.

The type of this very distinct little species from Texas is in the Museum of Comparative Zoology, in Cambridge, Massachusetts, received from Chambers. It is a true *Cosmopteryx*, easily distinguished from all other described American species by the suffused yellow fascia, which spreads all over the apical half of the wing and surrounds the metallic spots, instead of being limited by them as is usual.

The antennæ are lost in these types, which are the only specimens known to me.

COSMOPTERYX CHALYBÆLLA Walsingham.

Cosmopteryx chalybælla WALSINGHAM, Dyar, Cat. N. Am. Lep., 1903, No. 6061.

I have examined the type in Lord Walsingham's collection, but my notes on it are not so full as I would like. I know of no other specimens of this species, which, according to Lord Walsingham, has apex of antennæ white, "with two or more white rings preceded by a dark band before it."^a The species was described from Texas.

COSMOPTERYX DELICATELLA Walsingham.

Cosmopteryx delicatella WALSINGHAM, Dyar, Cat. N. Am. Lep., 1903, No. 6063.

The type of this species from North Carolina is in Lord Walsingham's collection, where I have examined it. In the U. S. National Museum is a specimen from Washington, District of Columbia (Busck). The antennæ ornamentation is, according to the description, as follows: "Brown, the apex broadly white with two narrow white rings separated from apex by a still broader brown band."

COSMOPTERYX MINUTELLA Beutenmüller.

Cosmopteryx minutella BEUTENMÜLLER, Dyar, Cat. N. Am. Lep., 1903, No. 6069.

The type (No. 497) of this species is in U. S. National Museum; it is minus antennæ and not in very perfect condition otherwise, but is easily distinguished from the preceding and from the following species with which it has the black spot on the basal part of the fascia in common by the characters, given in the synoptic table. The description gives no mention of the antennæ and I know of no other specimen besides the type.

COSMOPTERYX FERNALDELLA Walsingham.

Cosmopteryx fernaldella WALSINGHAM, Dyar, Cat. N. Am. Lep., 1903, No. 6064.

This species is, as mentioned by the writer,^b the same as described by Beutenmüller as *Cosmopteryx floridanella*^c and by the writer as *C. nigrapunctella*. In the U. S. National Museum are, besides the types of both these species, other specimens from Hasting, Florida, Washington, District of Columbia (Busck), and Hazleton, Pennsylvania (Dietz). I have examined Lord Walsingham's types in Professor Fernald's collection and in England. The coloration of the antennæ distinguishes this also otherwise very distinct species from the other American forms; apical joint is black, the next 6 or 7 joints white, the following 2 black, and the next 2 white.

^a Insect Life, I, 1889, p. 289.

^b Proc. U. S. Nat. Mus., XXVII, 1904, p. 769.

^c Dyar, Cat. N. Am. Lep., No. 6065.

COSMOPTERYX MONTICELLA Chambers.

Cosmopteryx monticella CHAMBERS, Dyar, Cat. N. Am. Lep., 1903, No. 6070.

I have examined the types of this species in the Museum of Comparative Zoology in Cambridge, Massachusetts, and in Professor Fernald's collection. They are identical with a specimen determined by Lord Walsingham in the U. S. National Museum from California. Chambers's types came from Colorado. The antennæ have the following coloration: Apical 5 joints white, following 7 joints black, next 1 white, next 2 black.

COSMOPTERYX NITENS Walsingham.

Cosmopteryx nitens WALSINGHAM, Dyar, Cat. N. Am. Lep. N. Am., 1903, No. 6071.

Professor Fernald was so kind as to give me parts of the type material of this species during a visit to his home in 1902. Besides this specimen, which I compared with Lord Walsingham's type in England last spring, there are others, probably all from the same series, in the U. S. National Museum from Texas.

It is a striking species, easily distinguished by the longitudinal black streak in the yellow cilia, as well as by the coloration of the antennæ, which is as follows: Two apical joints white, 7 succeeding joints black, next 1 white.

COSMOPTERYX CLANDESTINELLA, new species.

Antennæ blackish brown; each joint of basal half dotted with silvery white; the last four apical joints white, the five preceding ones black, followed by two or three white joints. Labial palpi blackish brown, silvery on the inside, and with two longitudinal silvery white lines. Face silvery white, iridescent. Head and thorax dark brown, strongly metallic. Forewings blackish brown; basal half without any white markings, but with two oblique, converging, short, broad, somewhat confluent, bluish metallic streaks, equidistant from the base, one on the subcostal vein, the other, and somewhat larger, below the fold. Just outside the middle of the wing is a narrow, complete violet and silvery metallic fascia followed by a short space of the ground color; then follows the usual reddish yellow fascia, which has an angulated posterior edge, being much and abruptly prolonged along the costal edge; it is limited posteriorly by a large violet metallic dorsal spot and by a few metallic costal scales, which are in turn followed by a white costa streak prolonged into the cilia. Apical part of the wing dark brown, with a small silvery white dorsal dash just before the tip. Hindwings dark fuscous. Abdomen blackish brown. Legs silvery white on the inner side, black barred with white on the exterior side; posterior tibiae with three long erect tufts of black hairs; tarsi black, each joint tipped with silvery white.

Alar expanse.—8 mm.

Habitat.—District of Columbia, Virginia, Maryland.

Food plant: *Panicum clandestinum*.

Type.—Cat. No. 9777, U.S.N.M.

Described from many specimens bred by the writer from mines collected early in June in the country surrounding Washington City.

The mine is an irregular longitudinal clear blotchmine with the frass ejected at one end. The larva is light green with short light hairs and with yellow head and thoracic shield. At maturity it assumes a brilliant wine-red color in three broad longitudinal stripes, and cuts a circular piece out of the epidermis of its mine, which it bends lengthwise and uses for a cocoon exactly like the genus *Cycloplasis* Clemens.

The imagoes issued late in July. Dr. H. G. Dyar has made the following description of the larva:

Head flattened, disk-like, elongate, clypeus rather broadly triangular, lobes meeting above, pale, unmarked. Cervical shield large, very weakly cornified, ill defined, luteous; body slightly flattened, subequal tapering at the ends, segments submoniliform; feet normal, moderate, the thoracic ones distinct pale, the abdominal ones truncate cylindrical, with a small circle of hooks; setae small and obscure, pale, without distinct tubercles, fairly long, apparently normal, iv and v separate. Color pale, with broad blotchy subdorsal and subventral broad red stripes.